

**1966 OPERATING SUMMARY**

# **ELORA**

## **water pollution control plant**

TD  
227  
E467  
W38  
1966

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**ONTARIO WATER RESOURCES COMMISSION**

***Division of Plant Operations***

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ONTARIO WATER RESOURCES COMMISSION  
OFFICE OF THE GENERAL MANAGER

General Manager,  
Ontario Water Resources Commission.

Dear Sir:

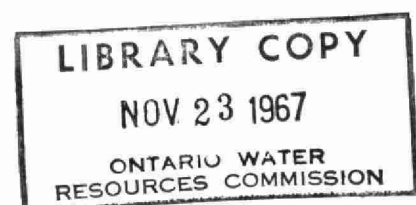
I am happy to present you with the 1966 Operating Summary for the Elora Water Pollution Control Plant, OWRC Project No. 62-S-125.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,  
General Manager.



TD  
227  
E467  
W38  
1966  
MOE

ASVQ



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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TELEPHONE 365-

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

Members of the Elora Local Advisory Committee,  
Village of Elora.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the  
Elora Water Pollution Control Plant, OWRC Project No. 62-S-125.

It is hoped that our joint participation in efforts to combat water pollution  
will have even more success in the coming year.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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**ELORA**  
**water pollution control plant**

operated for

THE VILLAGE OF ELORA

by the

ONTARIO WATER RESOURCES COMMISSION

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DIVISION OF PLANT OPERATIONS

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Assistant Director:	C. W. Perry
Regional Supervisor:	D. A. McTavish
Operations Engineer:	B. W. Hansler

801 Bay Street	Toronto 5
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## **'66 REVIEW**

A total of 18,142 million gallons of sewage was treated during the year at a cost of \$6,508.59. The operating cost per million gallons was \$358.76, compared to \$509.45 in 1965. The cost per pound of BOD removed in 1966 was \$0.16 compared to \$0.32 in 1965.

The decrease in the unit costs of treatment is due to a decrease in salary costs and an increase in flow to the plant. During the later part of the year, arrangements were made for the joint operation of the Elora Water Pollution Control Plant and the Fergus Water Pollution Control Plant utilizing the existing OWRC staff at Fergus. This arrangement for joint operation reduced the salary costs for both participating plants.

Although the average raw sewage BOD and suspended solids concentrations of 241 ppm and 469 ppm respectively were higher than the design values, the effluent BOD and suspended solids concentration of 12 ppm and 13 ppm were within the OWRC objective of 15 ppm for each. This reduction of sewage strength indicates that the plant was operated efficiently during the year.

The average daily flow of 49,700 gallons was 60 percent of the design capacity.

## PROJECT COSTS

NET CAPITAL COST (Estimated)		\$361,307.84
DEDUCT - Portion Financed by CMHC (Estimated)	\$122,424.66	
- Payments from Municipality	<u>41,231.20</u>	163,655.86
Long Term Debt to OWRC		<u>\$197,651.98</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966		\$ <u>10,981.55</u>
Net Operating		\$ 6,508.59
Debt Retirement		4,001.00
Reserve		2,239.48
Interest Charged		10,990.34
TOTAL		\$ <u>23,739.41</u>

### RESERVE ACCOUNT

Balance at January 1, 1966	\$ 3,083.52
Deposited by Municipality	2,239.48
Interest Earned	<u>219.78</u>
	\$ 5,542.78
Less Expenditures	<u>-</u>
Balance at December 31, 1966	\$ <u>5,542.78</u>

## MONTHLY OPERATING COSTS

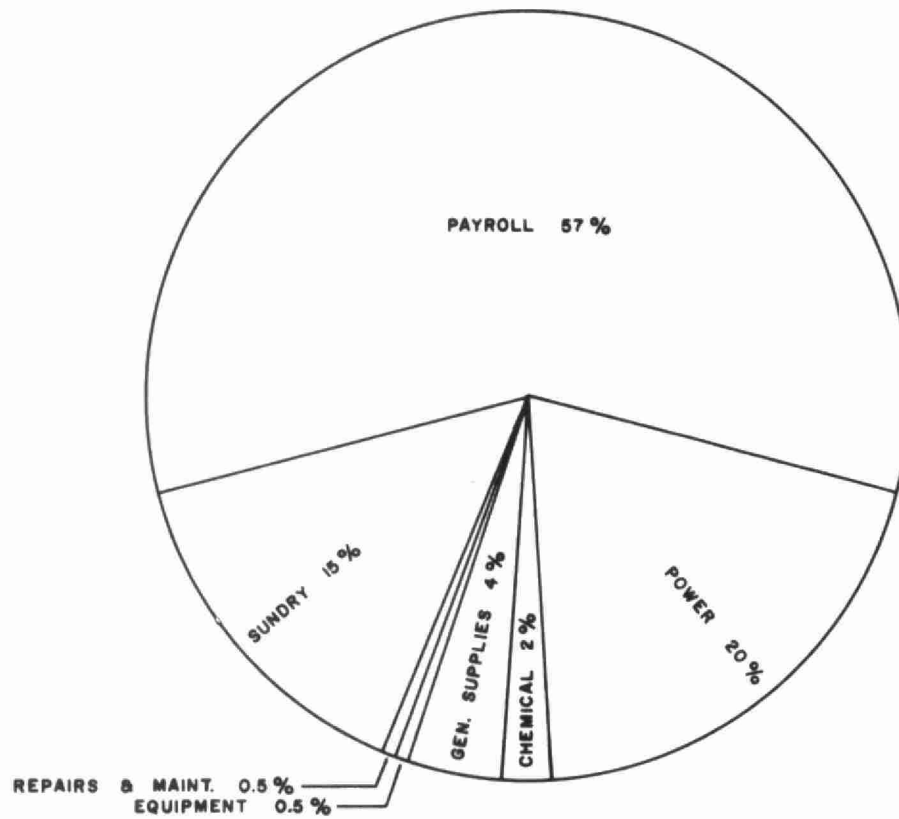
MONTH	TOTAL EXPENDITURE	PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY
JAN	420.57	320.92	85.86					13.79
FEB	469.71	316.56	103.42		37.44			12.29
MARCH	496.20	320.92	103.52		39.21		17.51	15.04
APRIL	1004.36	535.18	115.75		19.22	3.13		331.08
MAY	523.01	332.98	106.46		5.50			78.07
JUNE	680.40	365.80	104.22		22.74			187.64
JULY	453.11	331.71	101.53		19.87			
AUG	756.13	591.62	106.46		22.18			35.87
SEPT	330.70	110.80	115.40		14.47	21.53		68.50
OCT	440.70	128.46	111.17	141.75	13.24	17.64		28.44
NOV	358.33	138.34	114.83		36.72			68.44
DEC	575.37	287.61	125.92		19.83		15.75	126.26
TOTAL	6508.59	3780.90	1294.54	141.75	250.42	42.30	33.26	965.42

## YEARLY OPERATING COSTS

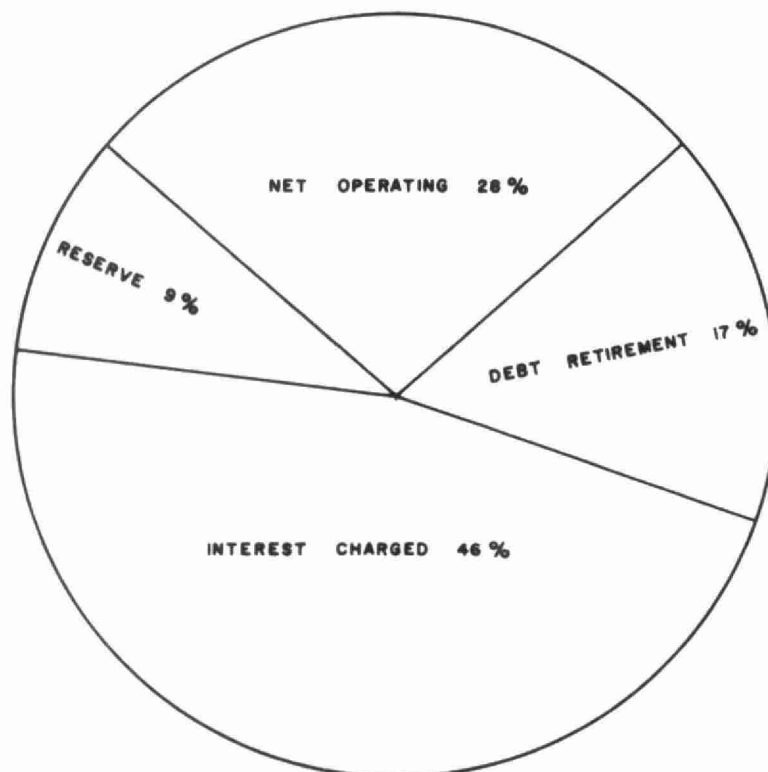
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1965	13,111	\$ 6679.39	*	509.45	32 CENTS
1966	18,142	6508.59	16.38	358.76	16 CENTS

\* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

## 1966 OPERATING COSTS



## TOTAL ANNUAL COST



## Process Data

### FLOW

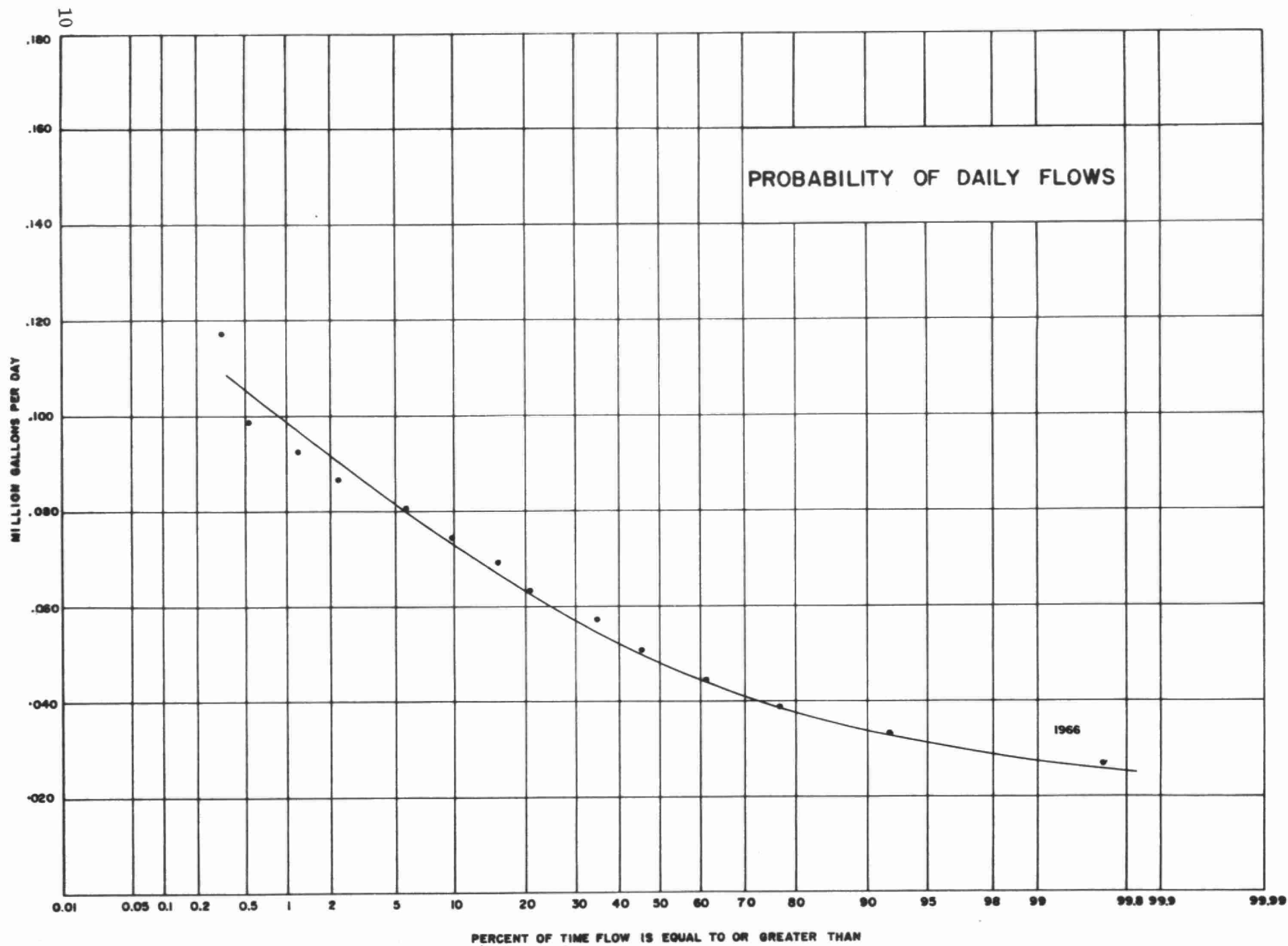
Daily average flows plotted on a monthly basis and on a probability basis are shown in the accompanying graphs. The unusual trend toward high flows is probably due in part to a malfunction on the flow meter which has since been rectified.

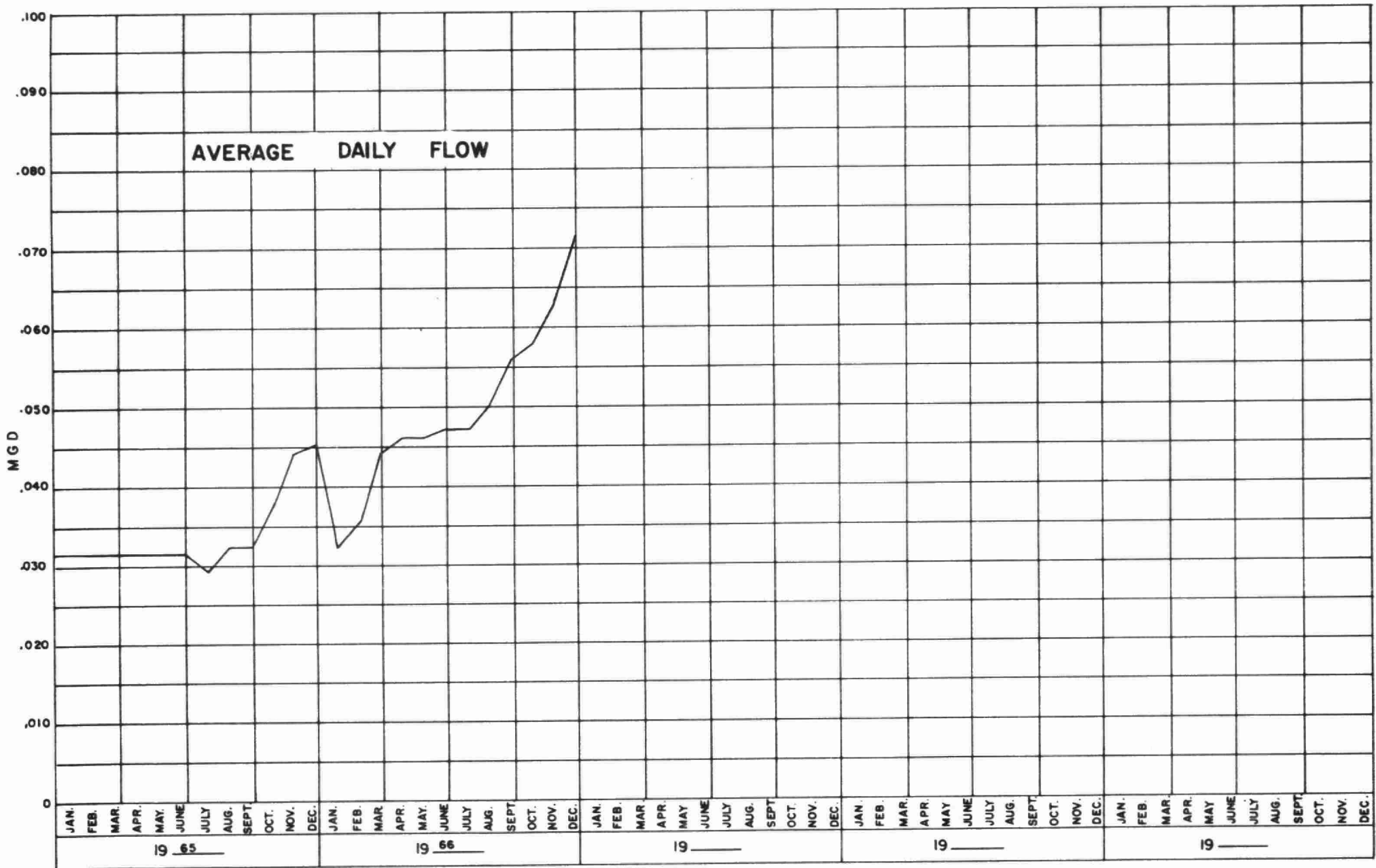
The average daily flow for the year of 49,700 gallons represents 60% of the design flow of 83,000 gallons per day. The design flow was exceeded 4% of the time.

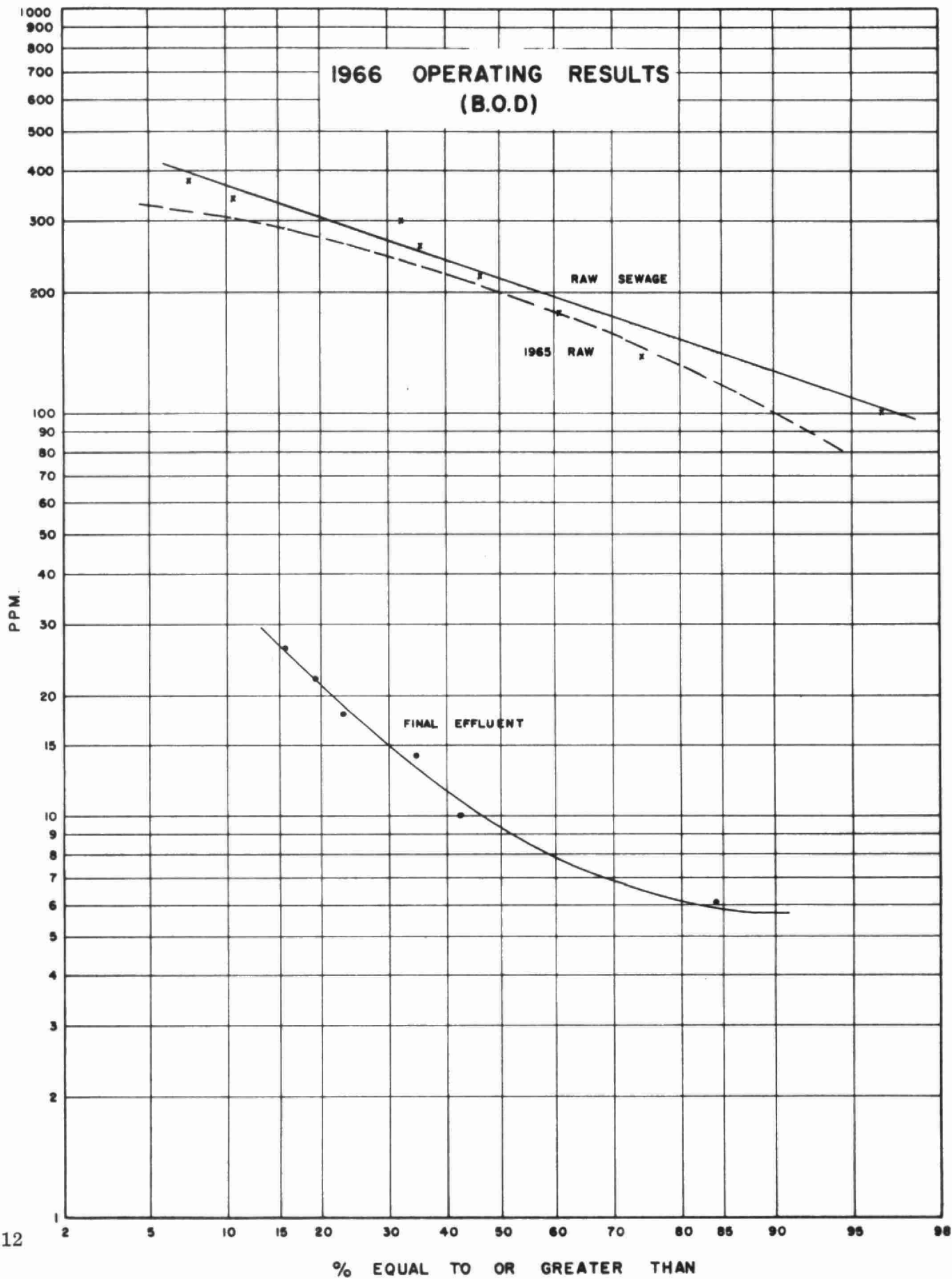
### BOD and SUSPENDED SOLIDS

The probability graphs of BOD and suspended solids concentration indicate that during 1966, the design raw sewage BOD concentration of 210 ppm was exceeded 53% of the time and the design suspended solids concentration of 250 ppm, 64% of the time. From the average BOD concentration and average flow for the year, it can be seen that the BOD loading was 69% of the design value and the corresponding value for suspended solids was 112% of the design value.

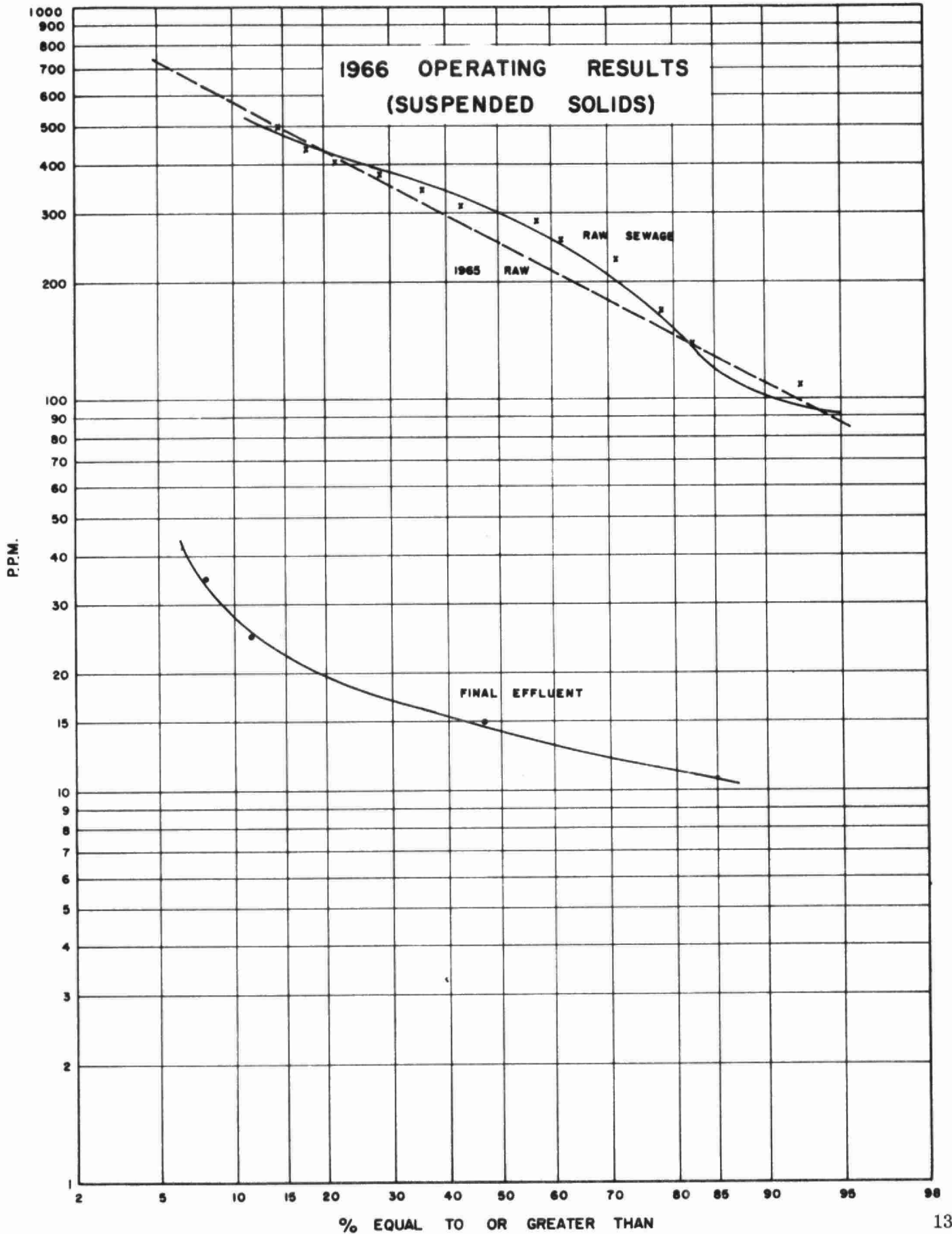
The plant effluent BOD and suspended solids concentrations exceeded the OWRC objective of 15 ppm 30% and 43% of the time respectively.

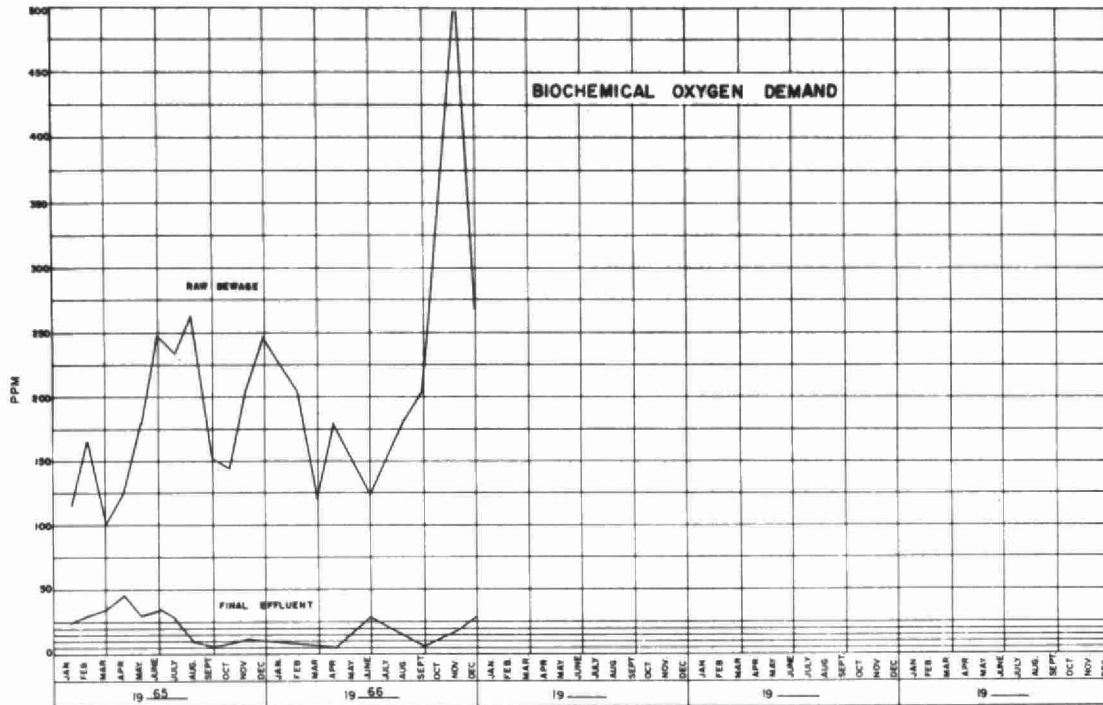




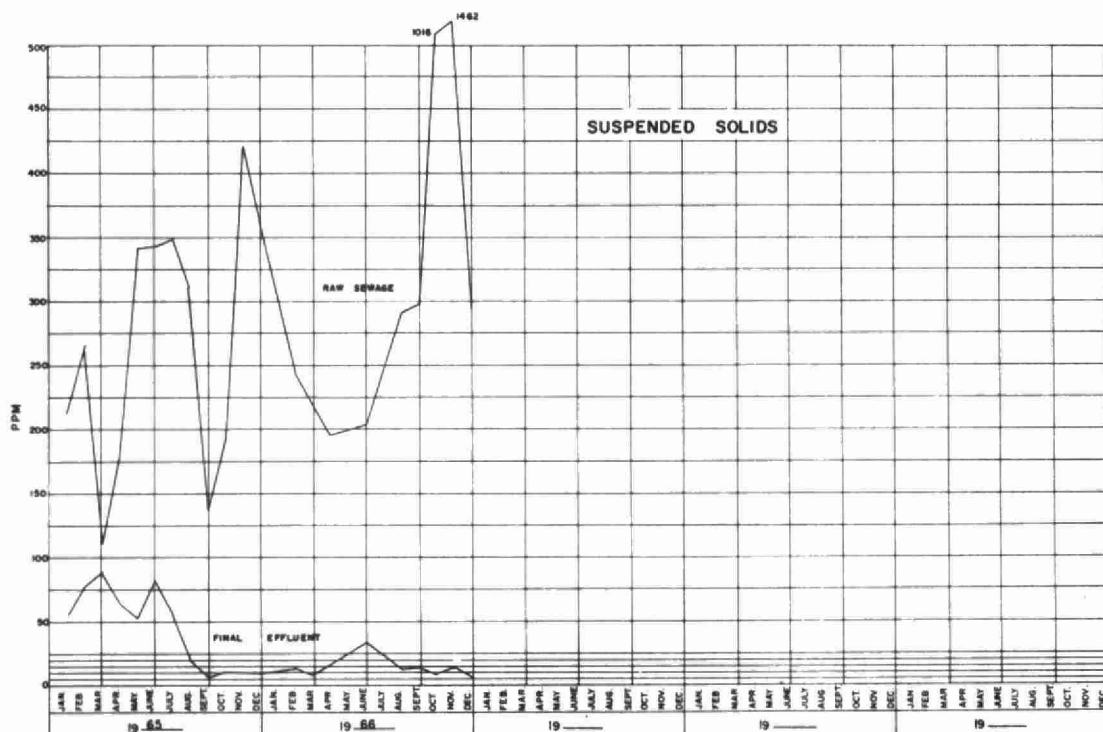








## MONTHLY VARIATIONS



## GRIT, B.O.D AND S.S. REMOVAL

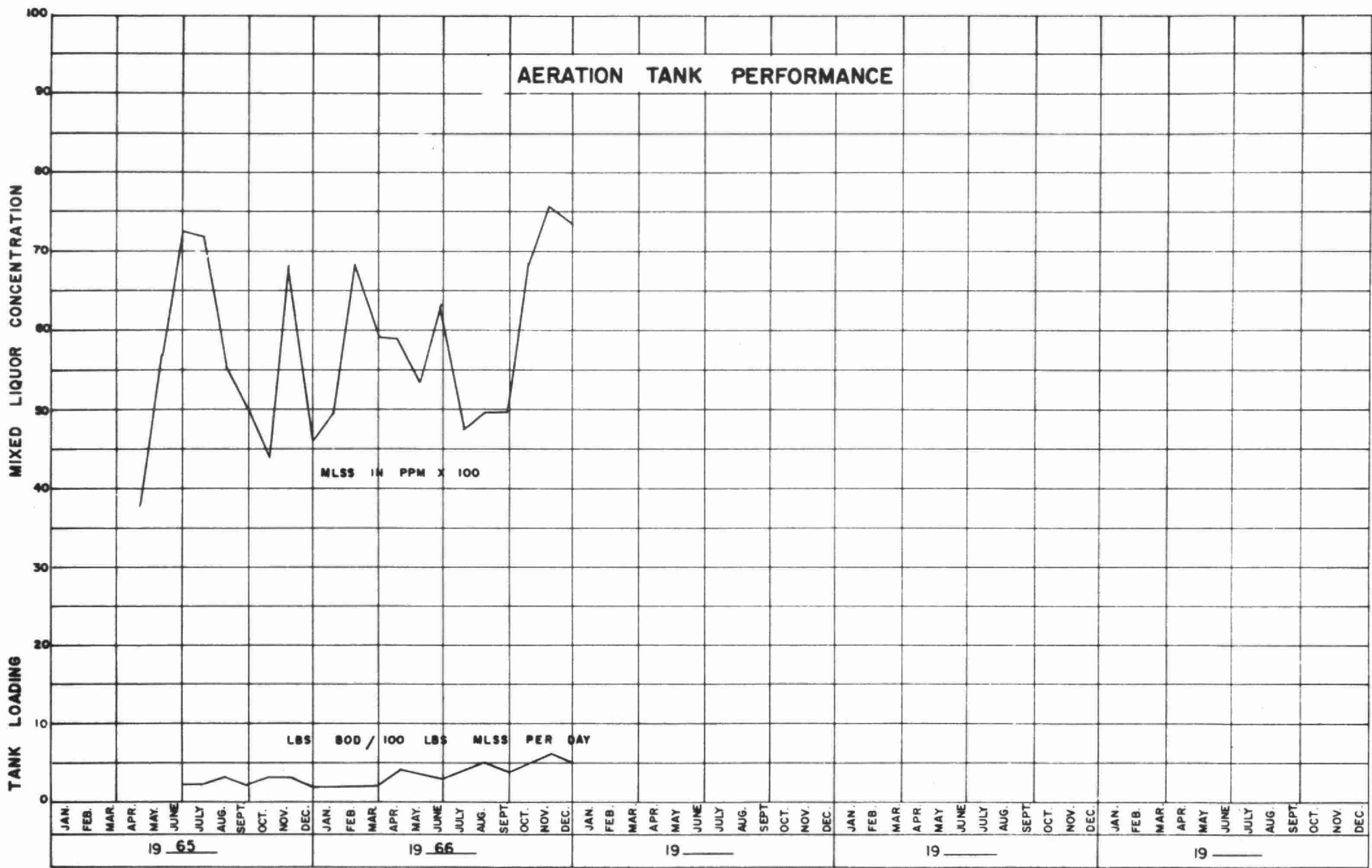
MONTH	B. O. D.				S. S.			
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED
JAN.	241	12	95.0	1.1	469	13	97.0	2.3
FEB.	201	6.3	97.0	0.9	242	12	95.0	1.1
MAR.	117	5.1	95.5	0.8	219	7	97.0	1.4
APR.	179	4	98.0	1.2	196	17	91.5	1.2
MAY	241	12	95.0	1.6	469	13	97.0	3.2
JUNE	124	26	79.0	0.7	204	34	83.5	1.2
JULY	241	12	95.0	1.7	469	13	97.0	3.3
AUG.	181	12	93.5	1.3	293	11	96.5	2.2
SEPT.	201	5	97.5	1.6	300	13	95.5	2.4
OCT.	345	10	97.0	3.0	1016	8	99.0	9.1
NOV.	554	16	97.0	5.1	1462	13	99.1	13.7
DEC.	269	27	90.0	2.7	288	6	98.0	3.1
TOTAL	-	-	-	20.8	-	-	-	41.4
AVG.	241	12	95.0	1.7	469	13	97.0	3.4

### COMMENTS

The average raw sewage BOD concentration of 241 ppm was 115% of the design concentration of 210 ppm and the raw sewage suspended solids concentration of 469 ppm was 188% of the design value of 250 ppm.

The average effluent BOD and suspended solids concentrations of 12 ppm and 13 ppm respectively were below the OWRC objective of 15 ppm for each.

An average reduction in 95% for BOD and 97% for suspended solids indicates that the plant provided excellent treatment during the year.



## AERATION SECTION

MONTH	PRIM. EFFL * B.O.D. PPM.	MLSS. PPM.	LBS BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	-	4976	-	-
FEBRUARY	201	6846	2	5691
MARCH	117	5926	2	7693
APRIL	179	5900	3	5250
MAY	-	5335	-	-
JUNE	124	6321	2	7826
JULY	-	4714	-	-
AUGUST	191	4992	3	5000
SEPTEMBER	201	4959	3	4027
OCTOBER	345	6863	3	2107
NOVEMBER	554	7593	5	1059
DECEMBER	269	7357	3	2093
TOTAL	-	-	-	-
AVERAGE	241	5982	3	4527

\* Raw BOD, no primaries

### COMMENTS

The average aeration tank loading of 3 lbs. BOD per 100 lbs. MLSS is within the recommended range of loading for an extended aeration process of 1 to 5 lbs. of BOD per 100 lbs. MLSS.

## CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	0.993	31	3.12
FEBRUARY	0.973	32	3.29
MARCH	1.362	31	2.28
APRIL	1.380	30	2.17
MAY	1.419	31	2.18
JUNE	1.408	30	2.13
JULY	1.466	31	2.11
AUGUST	1.554	120	7.72
SEPTEMBER	1.676	97	5.79
OCTOBER	1.812	113	6.24
NOVEMBER	1.897	131	6.90
DECEMBER	2.202	159	7.22
TOTAL	18,142	836	-
AVERAGE	1.512	70	4.61

## COMMENTS

An average dosage rate of 4.61 ppm of chlorine was required in 1966 to maintain a residual of 0.5 ppm.

Prechlorination of the influent sewage for odour control accounts for the higher dosage rate during the period from August to December.



## CONCLUSIONS

The plant provided good treatment during the year, producing an effluent with an average BOD of 12 ppm and suspended solids of 13 ppm.

The arrangement prevailing in the latter half of the year to staff the plant on a part-time basis has proven successful and economical.

## RECOMMENDATIONS

Since the staff requirement at the plant is less than one operator, it is recommended that the present arrangement of staffing the plant be continued.

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Ontario Water Resources Co  
Elora water  
pollution control plant: asvq

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summary



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